

NEW SPECIES OF THE *POLYRHACHIS (MYRMA) PARABIOTICA*
SPECIES GROUP (HYMENOPTERA: FORMICIDAE:
FORMICINAE) FROM THE PHILIPPINES

RUDOLF J. KOHOUT

Biodiversity Program, Queensland Museum, PO Box 3300, South Brisbane, Qld 4101
(e-mail: kohout@powerup.com.au)

Abstract

Two new species of the here established *Polyrhachis parabiotica* species group, *P. chapmani* sp. n. and *P. empesoi* sp. n., are described from Negros Island in the Philippines. A key to the known members of the group is provided and the new species are illustrated.

Introduction

During two visits to the Museum of Comparative Zoology at Harvard University, I had the opportunity to study specimens of Philippine *Polyrhachis* Fr. Smith ants collected by James W. Chapman and Domingo Empeso. This material contained two new species that are closely related to *P. parabiotica* Chapman, described in 1963 as the only member of a new monotypical subgenus *Anoplomyrma* Chapman. Hung (1967) considered *Anoplomyrma* to be very similar to the subgenus *Myrma* Billberg, but he did not dispute its validity. Dorow (1995) listed *Anoplomyrma* as a junior synonym of *Myrma* and I agree with this decision but, because of the unique combination of characters found in *P. parabiotica*, I am placing it, and two new species described below, into a separate species group within *Myrma*. All three species are restricted to the Philippines. A fourth species, *P. paracamponota* Wang & Wu from Guangxi, China, is tentatively placed in this group based on its original description, but I have been unable to examine the holotype (or any other material) to confirm its position there.

Abbreviations of institutions (with names of cooperating curators) are: ANIC = Australian National Insect Collection, CSIRO Entomology, Canberra, ACT, Australia (Drs S.O. Shattuck and R.W. Taylor); BMNH = The Natural History Museum, London, UK (B. Bolton); MCSN = Museo Civico de Storia Naturale 'Giacomo Doria', Genova, Italy (Drs R. Poggi and V. Raineri); MHNG = Muséum d'Histoire Naturelle, Geneva, Switzerland (Drs C. Besuchet, I. Löbl and B. Merz); MCZC = Museum of Comparative Zoology, Harvard University, Cambridge, Mass., USA (Dr S.P. Cover); QMBA = Queensland Museum, Brisbane, Qld, Australia (Drs C. J. Burwell and G.B. Monteith); RIFC = The Research Institute of Forest Protection, Chinese Academy of Forestry, Beijing, China (Drs Wu Jian and Zhang Yongan).

Methods

Photographs of specimens were taken by Dr Gary Alpert with a Spot 3RT scanning digital camera attached to a Leica MZ16 stereomicroscope. Images were processed using Auto-Montage (Syncroscopy, Division of Synoptics Ltd, USA) software. All photographs are of the primary types.

References and synonyms of individual species are listed only where relevant to the context of this paper. For full synonymy citations see Bolton (1995) and Dorow (1995). Publication dates and the spelling of species epithets follow Bolton (1995).

Standard Measurements and Indices used in the text are: TL = Total length (the necessarily composite measurement of the outstretched length of the entire ant measured in profile); HL = Head length (the maximum measurable length of the head in perfect full face view, measured from the anterior-most point of the clypeal border or teeth, to the posterior-most point of the occipital margin); HW = Head width (width of the head in perfect full face view, measured immediately in front of the eyes); CI = Cephalic index ($HW \times 100/HL$); SL = Scape length (excluding the condyle); SI = Scape index ($SL \times 100/HW$); PW = Pronotal width (width of the pronotal dorsum measured at the bases of pronotal spines); MTL = Metathoracic tibial length (maximum measurable length of the tibia of the hind leg). Measurements were taken using a Zeiss SR stereomicroscope with an eyepiece graticule calibrated against a stage micrometer. All measurements are expressed in millimetres (mm).

Characters of the *P. parabiatica* species group

The *P. parabiatica* species group, here established, is named after the name-bearing species *P. parabiatica* Chapman. Chapman (1963) failed to give the diagnostic characters of his newly established subgenus *Anoplomyrma*, but they can be deduced from the description of *P. parabiatica*, as follows: pronotum armed with well developed, anteriorly directed spines; mesosoma convex with the mesonotum virtually immarginate (except in the new species described below, where poorly developed obtuse margins are evident under certain angles of illumination); propodeum totally immarginate laterally and posteriorly, with no propodeal teeth or tubercles; petiole scale-like, with dorsal margin more-or-less rounded or emarginate medially, laterally delimited by a blunt angle. The characters of the *P. parabiatica* group are essentially those of *Anoplomyrma*, except that the pronotal spines may be reduced to short humeral teeth as in *P. paracamponota*.

Key to workers of the *P. parabiatica* species group

- 1 Pronotal humeri armed with short teeth *paracamponota* Wang & Wu
- Pronotal humeri armed with relatively long, anteriorly directed spines ... 2
- 2 Head, mesosoma and gaster distinctly yellowish-red or light reddish-brown; erect or curved hairs abundant everywhere, including appendages, hairs longer than greatest diameter of eye *parabiatica* Chapman
- Head and mesosoma black with gaster dark brown or red; numerous erect or suberect hairs present only on head and gaster, hairs shorter than greatest diameter of eye 3

- 3 Body jet-black and highly polished, with very short, sparse golden pubescence; anterior clypeal margin entire *chapmani* sp. n.
- Body finely shagreened, opaque, with short, appressed, silvery or yellowish-golden pubescence; anterior clypeal margin medially notched *empesoi* sp. n.

***Polyrhachis parabiatica* Chapman, 1963**

(Figs 1, 4, 7)

Polyrhachis (Anoplomyrma) parabiatica Chapman, 1963: 258, fig. 7. Syntype workers, queens in MCZC. Type locality: PHILIPPINES, Negros I., Cuernos de Negros, 1500-4000 ft (J.W. Chapman). [2 workers, queen examined].

Additional material examined. PHILIPPINES: Negros Oriental, Lake Balinsasayao, Sibulan, 30.v.1983 (C.K. Starr & F.P. Godoy) (w) (in BMNH and QMBA).

Dimensions of syntypes (Queen cited last): TL c. 6.30, 6.00, 6.90; HL 1.65, 1.68, 1.78; HW 1.40, 1.40, 1.50; CI 85, 83, 84; SL 1.87, 1.96, 1.96; SI 133, 140, 131; PW 1.06, 1.06, 1.43; MTL 2.03, 2.15, 2.12 (2 workers and queen measured; all specimens, notably the queen, are covered in glue and some measurements are only approximate).

Remarks. Chapman (1963) noted that the type colony of *P. parabiatica* was collected on 12.ix.1948 'in a dead frond of a tree fern. The fern trunk was partly surrounded by a mound nest of *Myrmecaria* [*sic* = ?*Myrmecaria* Saunders] ... Both workers and females closely resemble *Myrmecaria* in color very closely. This is, the only nest I ever found'. Chapman also mentioned that he collected workers and dealate queens of *P. parabiatica* from forays of '*Myrmecaria*' on the Cuernos de Negros at 1500 to 4000 ft altitude for many years. However, the specimens collected at Lake Balinsasayao by Starr and Godoy, lodged in BMNH and QMBA, are the only specimens, besides the types, that I have located in collections.

***Polyrhachis chapmani* sp. n.**

(Figs 2, 5, 8)

Types. *Holotype worker*, PHILIPPINES: Oriental Negros Prov., Cuernos de Negros Mts, 3600 ft, 30.ix.1942, J.W. Chapman. *Paratypes*: 38 workers, 2 queens, 2 males, data (and nest) as for holotype; 4 workers, 2 queens, data as for holotype except 1942-43, hollow vine. Holotype and most paratype workers, 3 queens and males in MCZC; 3 workers and queen in QMBA; 2 workers in each of ANIC and BMNH.

Additional material examined. PHILIPPINES: Negros Oriental, Cuernos de Negros Mts, 3600 ft (various dates of collection - 1942-1943 and 1948) (J.W. Chapman) (w, ♀, ♂); Mindanao, 11 km W Alanib, (08°03'N, 124°57'E), 1160 m, 9.ix.1978, relict rf. (B.B. Lowery) (w) (in MCZC).

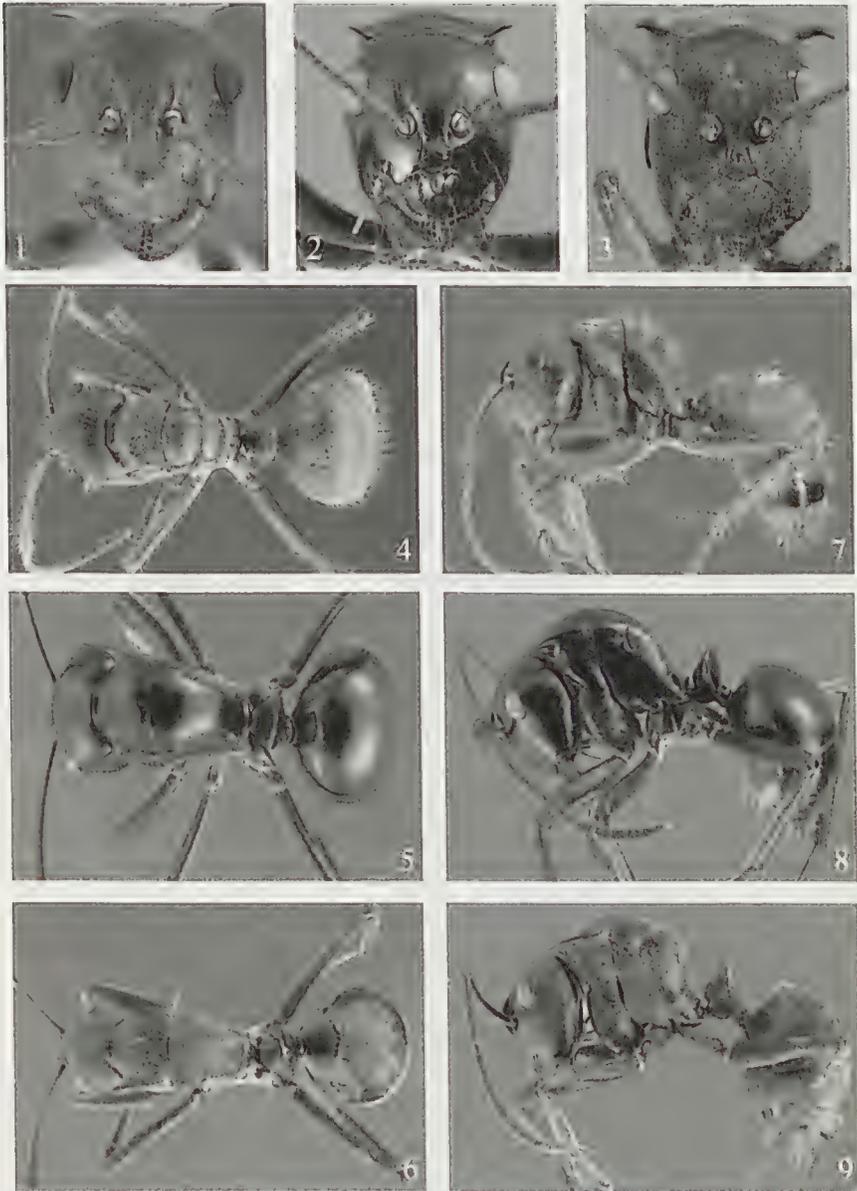
Description. Worker. Dimensions (holotype cited first): TL c. 6.55, 6.00-7.21; HL 1.65, 1.53-1.68; HW 1.40, 1.28-1.43; CI 85, 84-87; SL 2.09, 1.93-2.15; SI 149, 144-154; PW 1.09, 1.03-1.15; MTL 2.15, 2.03-2.28 (18

measured). Mandibles with 5 teeth reducing in length towards base. Anterior clypeal margin arcuate, entire. In profile clypeus straight anteriorly, slightly convex posteriorly with shallow depression just in front of weakly impressed basal margin; laterally basal margin represented by only a thin line. Frontal triangle indistinct. Frontal carinae sinuate with margins at mid length moderately raised and weakly laminate, rather flat and parallel posteriorly. Central area relatively narrow anteriorly, with only barely indicated median furrow. Sides of head in front of eyes almost straight, weakly converging anteriorly towards mandibular bases; rounded behind eyes into convex, medially narrowly emarginate occipital margin. Eyes convex, in full face view exceeding lateral cephalic outline. Ocelli lacking. Pronotal dorsum weakly convex between pair of relatively long, horizontal, anteriorly directed, somewhat dorsomedially flattened spines; lateral margins of spines sharp, continuous with rather blunt lateral pronotal margins that terminate just before reaching promesonotal suture. Mesonotal dorsum with only ill-defined lateral margins; metanotal groove distinct. Propodeum immarginate laterally and posteriorly, without propodeal teeth or tubercles. Petiole scale-like, anterior face weakly convex, posterior face almost flat; dorsal margin rather acute, shallowly emarginate medially. Subpetiolar process in profile rounded anteriorly and posteriorly. Anterior face of first gastral segment lower than height of petiole, with anterodorsal face widely rounding onto dorsum of segment.

Mandibles finely, longitudinally striate with numerous piliferous pits. Body surfaces very finely reticulate, rather polished. Intensity of sculpturation marginally increasing laterally, with sides of mesosoma finely, irregularly wrinkled. Numerous shallow punctures scattered over most body surfaces.

Mandibles with a few short, semierect, yellowish-golden hairs near masticatory borders and very short, appressed hairs towards bases. Anterior clypeal margin medially usually with three longer, anteriorly directed setae and one short seta on each side towards mandibular bases. Several pairs of relatively long, erect hairs near anterior and basal clypeal margins, along frontal carinae and on vertex. A few semierect hairs on anterior face of fore coxae and several shorter, erect hairs on ventral surfaces of femora. Numerous, semierect, somewhat posteriorly directed, relatively long hairs lining posterior margins of most gastral segments, particularly abundant around gastral apex. Very short, closely appressed, golden pubescence, arising from shallow pits, scattered over all body surfaces.

Head and mesosoma black; clypeus, meso- and metapleurae diffusely blotched red or reddish-brown. Mandibles reddish-brown with outer borders and teeth black. Petiole mostly black at base, progressively becoming reddish-brown towards dorsal margin. Antennae, coxae and legs light red or reddish-brown with tarsi and proximal ends of tibiae narrowly black. Gaster red with posterior margins of segments diffusely reddish-brown.



Figs 1-9. *Polyrhachis* spp. (1-3): Head in full face view. (1) *P. parabiatica* Chapman (syntype); (2) *P. chapmani* (holotype); (3) *P. empesoi* (holotype). (4-6): Dorsal view. (4) *P. parabiatica* Chapman (syntype); (5) *P. chapmani* (holotype); (6) *P. empesoi* (holotype). (7-9): Lateral view. (7) *P. parabiatica* Chapman (syntype); (8) *P. chapmani* (holotype); (9) *P. empesoi* (holotype).

Queen. Dimensions: TL c. 7.16-7.71; HL 1.78-1.84; HW 1.50-1.53; CI 83-86; SL 2.09-2.25; SI 139-150; PW 1.47-1.50; MTL 2.28-2.37 (4 measured). Queen very similar to worker with usual differences indicating caste, including three ocelli and complete thoracic structure. Clypeus in profile straight anteriorly, weakly convex posteriorly with basal margin very shallowly impressed. Eyes somewhat larger and more convex than in worker. Pronotal humeri with spines marginally shorter than in worker; mesoscutum wider than long, with lateral margins converging into anteriorly rounded margin; median line short, very poorly indicated; parapsides distinct, rather flat; mesoscutum in profile rounding anteriorly onto flat dorsum; mesoscutellum convex, marginally elevated above dorsal plane of mesosoma; metanotal groove strongly impressed. Propodeum rounded laterally and posteriorly. Petiole, subpetiolar process and anterior face of first gastral segment identical to those in worker. Mandibles finely longitudinally striate. All dorsal surfaces very finely reticulate, rather polished, but not as shiny as in worker. Pilosity similar to that in worker, with appressed pubescence more silvery and somewhat more abundant on pronotum, notably along anterior margin of mesoscutum. Black, with colour scheme virtually identical to that of worker, except appendages and gaster distinctly darker, reddish-brown.

Males and immature stages (larvae and pupae) in MCZC spirit collection.

Etymology. Named in honour of James W. Chapman, who collected many species of ants, including *Polyrhachis*, during his pre- and postwar residence in Dumaguete on Negros I., Philippines.

Remarks. Three of the worker specimens of the type series, originally mounted on a single pin, are furnished with a label inscribed: '*Polyrhachis (Anoplomyrma) negrosensis* sp.n. Chapman'. In spite of this unpublished name evidently proposed by Chapman, I believe that it is more appropriate to name this new species after him.

Polyrhachis empesoi sp. n.

(Figs 3, 6, 9)

Types. *Holotype worker*, PHILIPPINES: Oriental Negros Prov., Dumaguete, 30.iv.1924, J.W. Chapman. *Paratypes*: 12 workers, data as for holotype. Holotype and 4 paratypes in MCZC; 2 paratypes each in ANIC, BMNH and QMBA.

Additional material examined. PHILIPPINES: Negros Or., Dumaguete, Camp Lookout, 1500 ft, 1948 (J.W. Chapman) (♀); same locality, 1950 (J.W. Chapman) (♀); Luzon, Mt Makiling (Baker) (w); Camarines Sur, Mt Iriga, 500 m, 31.iii.1962 (H.M. Torrevillas) (w). Mindanao, Misamis Oriental, Sumay, Gingoog, 25.xii.1950 (Domingo Empeso) (w) (in MCZC).

Description. Worker. Dimensions (holotype cited first): TL c. 6.90, 6.65-7.21; HL 1.75, 1.68-1.75; HW 1.31, 1.28-1.33; CI 75, 74-76; SL 2.18, 2.18-2.28; SI 174, 166-176; PW 1.28, 1.15-1.28; MTL 2.15, 2.06-2.18 (13 measured). Mandibles with 5 teeth reducing in length towards base. Anterior

clypeal margin arcuate, distinctly notched medially. Clypeus with blunt, but distinct median carina; clypeus virtually straight in profile, only very shallowly concave behind anterior margin; basal clypeal margin flat, laterally represented by thin line. Frontal triangle indistinct. Frontal carinae sinuate with margins raised and moderately laminate at their mid length, rather flat and converging posteriorly. Central area relatively narrow anteriorly, with clearly indicated, short, smooth, median line. Sides of head in front of eyes almost straight, only weakly converging anteriorly towards mandibular bases; rounded behind eyes into highly convex occipital margin. Eyes convex, in full face view only marginally exceeding lateral cephalic outline. Ocelli lacking. Pronotal dorsum weakly convex between pair of relatively long, horizontal, anteriorly directed spines; lateral margins of spines blunt, continuous with rather blunt lateral pronotal margins that terminate just before promesonotal suture. Mesonotal dorsum with blunt lateral margins anteriorly, immarginate posteriorly; metanotal groove distinct. Propodeum immarginate laterally and posteriorly, without propodeal teeth or tubercles. Petiole scale-like, anterior and posterior faces almost flat, converging dorsally and forming acute, medially jagged dorsal margin. Subpetiolar process in profile rounded anteriorly and posteriorly. Anterior face of first gastral segment about as high as petiole, very weakly concave at base, with anterodorsal face narrowly rounding onto dorsum of segment.

Mandibles finely, longitudinally striate with numerous piliferous pits. All body surfaces finely, more-or-less uniformly reticulate-punctate with sculpturation only marginally more distinct laterally.

Mandibles with a few short, semierect, yellowish-golden hairs near masticatory borders and very short, closely appressed hairs towards bases. Anterior clypeal margin usually with three longer, anteriorly directed, medial setae and a few very short setae laterally towards mandibular bases. Clypeus with a few pairs of medium length, erect hairs near anterior and basal margins; distinctly shorter, anteriorly bent hairs along frontal carinae. Anterior face of fore coxae with several, long erect hairs; very short, solitary hairs on ventral surfaces of trochanters of mid and hind legs. Numerous, semierect, somewhat posteriorly directed, medium length hairs lining posterior margins of apical gastral segments, distinctly longer hairs along sternites and around gastral apex. Short, closely appressed, silvery pubescence abundant on all body surfaces; somewhat longer on meso- and metapleurac, almost completely hiding underlying sculpturation.

Body black, with mandibular masticatory borders, antennae, legs, including coxae, petiole and gaster, medium to dark reddish-brown.

Queen. Dimensions: TL c. 8.42-8.57; HL 2.06-2.09; HW 1.53; CI 72-73; SL 2.57; SI 168; PW 1.72; MTL (missing) (2 measured). Queen essentially as worker with usual differences indicating caste, including three ocelli and complete thoracic structure. Anterior clypeal margin distinctly notched

medially; clypeus in profile very weakly sinuate, shallowly concave anteriorly, weakly convex posteriorly, before descending into shallowly impressed basal margin. Eyes somewhat larger and more convex than in worker, clearly exceeding lateral cephalic outline. Pronotal humeri with spines marginally shorter than in worker; mesoscutum wider than long, with lateral margins converging into anteriorly rounded margin; median line clearly indicated; parapsides rather flat, weakly raised posteriorly; mesoscutum in profile rounding anteriorly onto flat dorsum; mesoscutellum only weakly convex, marginally elevated above dorsal plane of mesosoma; metanotal groove strongly impressed. Propodeum immarginate laterally; posteriorly rounding into weakly concave declivity. Petiole, subpetiolar process and anterior face of first gastral segment virtually identical to those in worker. Mandibles finely longitudinally striate. All dorsal surfaces with sculpturation and pilosity similar to that in worker. Body with relatively abundant appressed pubescence more yellowish-golden on head and pronotum, pale yellow on dorsum of gaster and silvery on lateral mesosoma and appendages. Head, mesosoma, petiole and gaster black, with mandibular masticatory borders and appendages dark reddish-brown.

Male and immature stages unknown.

Etymology. Named in honour of Domingo Empeso of Silliman University, Dumaguete, Philippines, who collected many *Polyrhachis* species together with J.W. Chapman on Oriental Negros and elsewhere in the Philippines.

Remarks. The two available queens are in poor condition. Both are missing numerous legs with one of them also missing the antennae. They were evidently collected separately from the workers, but their morphological characters and general appearance suggest that they are the queens of *P. empesoi*.

***Polyrhachis paracamponota* Wang & Wu**

Polyrhachis paracamponota Wang & Wu, 1991: 599, 601, figs 3, 7. Holotype worker in RIFC. Type locality: CHINA, Ningming Co., Guangxi Autonomous Region (Zhang Peiyi). [Not examined].

Dimensions of holotype: TL 6.46; HL 1.95; HW 1.65; CI 85; SL 2.53; SI 153; PW 1.40; MTL 2.74 (after Wang and Wu 1991).

Remarks. In spite of my personal communication with Drs Wu Jian and Zhang Yongan, I was unable to examine the holotype (and only known specimen) of *P. paracamponota* lodged in the collection of the RIFC. However, in the original description the authors commented that *P. paracamponota* was allied to *P. parabiatica* Smith (*sic*) from the Philippines, but differed in having the pronotum armed 'with two humeral teeth, not spines'. Dorow (1995) listed *P. paracamponota* within the subgenus *Myрма*. Because of its alleged similarity to *P. parabiatica*, I am provisionally placing it within the *P. parabiatica* species group.

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